

remarked that we had been photographing London smoke; and no doubt had not other localities for photographing the spectrum been chosen, the reproach (for such it was) might have been just. My visit last June to the Riffel, 8,500 feet high, showed that not only was this said line present, but that it was more intense even than at the level of the sea. There was more unfolding of the spectrum at that high altitude, and lines faint indeed, which had almost escaped registration below, were well marked on the photographs obtained there. The brilliancy of this infra-red spectrum can scarcely be surpassed. When examined at an elevation of 10,000 feet, the general absorption due to water almost vanishes, and with the exception of two congeries of lines which lie beyond those given in the diagram, the whole of the lines shown are stronger than I have ever had them before.

Colonel Festing and myself have also shown the presence of some alcohol derivative, somewhere between ourselves and the sun, and the presence of the absorption lines at a high altitude place it outside our atmosphere. This I was not wholly prepared for, since lately we have been told that alcohol exists in rain water, and rain water can only derive it from the air. The fact, however, remains that it probably exists beyond the limits of our atmosphere. The region disclosed by photography has by no means been exhausted; beyond the region given in the diagram lies one in which we have a breadth of continuous spectrum, and beyond that again beautiful groups of lines, all of which require and deserve careful study. Of one thing we may be fairly certain, that none of them are due to metallic vapours, but are probably due to vapours of non-metallic compounds in some form or another, and these at a comparatively low temperature. It is not unlikely that amongst these will be found oxygen compounds, and if so it would be interesting in more ways than one.

As a suggestion in which direction to look, I have annexed a diagram of the absorptions (Fig. 2), in the infra-red of a few liquids, by which it will be seen, that by a study of these we may perhaps throw some light on the solar spectrum. The bands in some instances where the liquid is vaporized are split up into lines and flutings, whilst the radical bands, to which I have already drawn attention, seem to remain constant. When it is remembered that one-tenth of an inch of a liquid, such as benzene, will give a definite absorption, it will be seen that a manageable length of vapour may be placed between the slit and the source of light, for its proper investigation. Colonel Festing and myself are at work at it at the present, but the field of investigation is so large that it requires more workers before any general theory can be brought to bear on the subject. It is partly to aid such would-be workers that I have penned the above, and shall be glad if it stirs up some few to aid in this research, which not only has a bearing on solar physics, but even still more largely on physical chemistry.

W. DE W. ABNEY

NOTES

WE have received a communication from Prof. Hildebrandsson, director of the Meteorological Observatory, Upsala, so well known for his researches into the upper currents of the atmosphere, in which, with reference to the proposed observatory on Ben Nevis, he remarks that "the erection on Ben Nevis of a permanent meteorological observatory is of the utmost importance for the development of modern meteorology. No better situation for a mountain observatory can be imagined. I have for a special purpose discussed the few observations published from Puy de Dôme. They are of great importance, but unfortunately this mountain, as well as the station of Gen. Nansouty on the Pic-du-Midi, has a bad situation in relation to storm tracks, being almost constantly placed on the north-westerly or south-easterly

slope of a high pressure. On the contrary, Ben Nevis is situated almost in the middle track of the depressions or storms of north-western Europe. Hence observations made there must be of far greater importance in their relation to the theory of cyclones than the mountain observations in the south of France. I hope the Scottish Meteorological Society will find the means of carrying on this work." With these views of Prof. Hildebrandsson we heartily concur, and hope that the Council of the Scottish Meteorological Society will succeed in the patriotic effort we understand that they are now making to raise the necessary funds, viz. 5000*l.*, for the erection and partial endowment of this truly national observatory.

WE are glad to learn that Sir Edward Reed is so far recovered that he may be able in the course of a few days to give occasional attendance in Parliament.

THE International Electrical Conference which has been sitting in Paris for the last fortnight, has, after passing several resolutions, adjourned to the first Monday of October, 1883. In regard to electrical units it was resolved that at present there is not a sufficient concord of view to enable the numerical value of the "ohm" in the mercurial column to be definitely fixed, and that all governments be appealed to by France to encourage further research on the subject. The section for "Earth Currents and Lightning Conductors" resolved that Government should be requested to favour regular and systematic observations of atmospheric electricity upon their telegraphic systems; that it is important for the study of storms to be extended to every country; that wires independent of the telegraphic system should be provided for the special study of earth currents; and that, so far as possible, the great subterranean telegraphic lines, particularly those running north and west, should be utilised for the same purpose, observations being instituted on the same day in the various countries. The section for fixing a standard of light expressed the opinion that the light emitted by a square centimetre of melting platinum would furnish an absolute standard. In closing the Conference M. Cochery, the Postal Minister, assured the Members that the French Government would endeavour to give effect to their Resolutions by representations to the various Governments concerned. It is hoped that the twelve months for which the Conference is adjourned will be sufficient for the searches in the various departments in question to be completed. England is indebted solely to the private enterprise and spirit of Sir William Thomson for being represented at all. Between the French Government, the Foreign Office, and the Science and Art Department a sad mess has been made. The Post Office Telegraph Department was never asked to send a representative, nor have any of those who took such an active part in the Conference last year been asked to take any part in this. A more disgraceful muddle has never previously distinguished our "how not to do it" system.

M. MIGNET, Perpetual Secretary of the Academy of Moral Sciences, has just resigned the office held by him from the reorganisation of the Academy in 1835, up to the present time. Having been born at the end of the last century, his plea of old age may be said to be fully justified. It is stated on good authority that he will be succeeded by M. Jules Simon, who is now temporarily filling the office of *secrétaire perpétuel*.

THE annual meeting of the five French Academies, sitting as one body in the capacity of the French Institute, was held on October 25. M. Dumas, as director of the Académie Française, was in the chair. He opened the proceedings by an address, which quite fulfilled the expectations that had been raised. M. Dumas gave an elaborate history of the several academies of Paris, of their suppression in 1793, and their re-opening in 1795 as the five classes of the Institute. The regu-

lations adopted at the time were altered by the several monarchical governments, but have gradually resumed their former provisions, so that the present Institute may be said practically to exist as it was at the end of the last century. The subject was treated with wonderful eloquence and expression. M. Dumas derived the origin of modern scientific societies from the *Accademia di Lincei*; he showed that the Academy of Sciences of Paris and the Royal Society of London came into existence about the same period, their meetings having been foreshadowed or instigated by the *conversazioni* held by the friends or followers of Descartes. M. Dumas insisted most on the grand spectacle exhibited by these institutions surviving monarchy, nobility, established churches, and finding in political revolutions a new field for their activity. He might have added, that even under the disorderly reign of the Commune, the sittings of the Academy were unmolested, and the editor of the *Journal Officiel de la Commune* did his best to report the sittings. The Academy of Sciences was represented in the addresses delivered by M. Alphonse Milne-Edwards, who gave a graphic account of the really good work done by the *Travailleur* in the Mediterranean and Atlantic. The large hall was crowded, and the whole proceedings were of high interest.

THE anniversary meeting of the London Mathematical Society will be held on the evening of Thursday, November 9, at 8 p.m., at 22, Albemarle Street. Mr. S. Roberts, F.R.S., has chosen as the subject of his valedictory address, "Some Remarks on Mathematical Terminology and the Philosophical Bearing of Recent Mathematical Speculations concerning the Realities of Space"; his principal aim will be to show that mathematics are neutral in philosophy. *Inter alia* he will report to the Society the fact of the establishment of the De Morgan memorial medal and the conditions of its being awarded. The following changes are proposed to be made in the Council for the ensuing session: Prof. Henrici, F.R.S., President, Sir J. Cockle, F.R.S., and Mr. Roberts, F.R.S., Vice-Presidents, and Messrs. E. B. Elliott and Dr. J. Hopkinson, F.R.S., to be new members in the place of Prof. Rowe and Mr. H. W. Lloyd Tanner, who retire.

THE *Japan Gazette* of August 21 contains a long and curious description of a bear festival among the Ainos. The writer, Dr. B. Scheube, is, we believe, the only European who has ever been actually present at this ceremony, the descriptions of it given by Miss Bird and other writers being derived from hearsay. The bear receives the title of *Kimui-Kamui*. The true derivation of this latter title—which is generally and incorrectly said to come from the Japanese *Kami*, a divinity—has been explained by Mr. Keane in *NATURE* (vol. xxvi. p. 525). The festival is now rarely held, and there is small reason to regret this, as it has degenerated to a brutal orgy. It commences with drink, every change in ceremony begins and concludes with drink, until finally every one in the village is intoxicated, while their hands, faces, and clothes are smeared with the gore of the sacrifice. Dr. Scheube says: "I had much difficulty in keeping off the drunken crowd that wanted me to partake of the blood and liver (the latter is eaten raw); and I can say that though hardened in these things by the practice of my profession, the sight of these drunken people with their bodies smeared over with blood filled me with a loathing that made me feel glad that the day and the feast were coming to an end together." Dances, many of them of an obscene nature, also form part of the ceremony.

A VERY business-like Annual Report from the Sheffield Free Libraries and Museum Committee has been sent us. Though complaint is made of the heavy cost of two of the branches, it is satisfactory to find that one of these rivals the Central Library in its number of volumes circulated. A new catalogue of the Central Library, which has been issued lately, we shall hope to notice more fully shortly. Besides the new branch of a musical department we may call attention also to the Observatory and

the Museum of Natural History, with the hope that, in all our large towns eventually, the Free Library will become the centre of instruction in all knowledge.

THE *Electrician* learns that the improvements in the storage of electric energy and in electromotors have so far advanced, that tricycles can not only be lighted, but also propelled solely by electricity, as was seen from the tricycle ridden last week by Prof. Ayrton in the city. The Faure accumulators in which the energy was stored for the lighting and drawing, were placed on the footboard of the tricycle, and the motion was produced by one of Professors Ayrton and Perry's newly-patented electromotors placed under the seat of the rider. Using one of these specially-made tricycle electromotors and the newest type of the Faure accumulators, the total dead weight to be added to a tricycle to light and propel it electrically, is only one and a half hundredweight, a little more than that of one additional person.

WE wish to call the attention of our readers to the "*Feuille des Jeunes Naturalistes*," published monthly in Paris, with a London agency at 110, Leadenhall Street. Founded at Mulhouse in Alsace in 1870, the young journal was hardly launched before the national troubles began; the publication was removed to Paris, where the two first editors both perished during the war at the age of about twenty. The object of the journal is to establish a medium of communication between young naturalists, to encourage them to publish their earliest essays in a serial where they will be sure to find readers to be instructed and competent judges to guide them in their future studies. Every kind of trustworthy observation is welcomed; and the editors undertake to translate communications sent to them in English. The Journal is believed to have been instrumental in the formation of several local natural history societies.

THE St. Petersburg Society of Gardening is taking the necessary steps to prepare the International Botanical and Gardening Exhibition and Congress, which will take place in the Russian capital. Professors Beketoff, Borodin, Famintzin, Marklin, and Maximowitsch, and Messrs. Annenkoff, Gobi, Iversen, Semenoff, and Wolkenstein are elected members of the scientific committee; three other committees—for the Exhibition, for the erection of buildings, and for the reception of guests—were appointed at the last meeting of the Society.

WE have received a copy of the syllabus of the Yorkshire College Students' Association. The society was founded in 1877, and is now in its sixth session. The number of members is large, and the meetings have hitherto been very successful. Attention is devoted to literature as well as to science. An excellent programme of papers is down for the present session which began on October 24 with an address by the president, Prof. Thorpe, on "The Story of the Origin of the Metric System."

THE German Ornithological Society held its annual meeting at Berlin recently under the presidency of Baron Homeyer. Mr. Schalow (Berlin) read a paper on the progress of ornithology during the last five years; Prof. Landois (Münster) on egg shells considered from a histological and a genetic point of view; Mr. Mützel (Berlin) on the call of the Tragopan; and Prof. Blasius the report of the stations for observing the migrations of birds in Germany.

TELEGRAMS from the south-east of Europe report that there was an earthquake in the northern part of the Balkan Peninsula on October 25. At 1.26 p.m. the shocks were felt severely at Preboi, in Bosnia. They lasted fully three seconds, the direction of the vibrations being from west to east.

THE first General Meeting of the Members of the Parkes Museum, since the incorporation of the Museum, was held on

Saturday last. Capt. Douglas Galton, C.B., was voted to the chair. It was unanimously resolved that H.R.H. Prince Leopold, Duke of Albany, who had graciously consented to accept the presidency, be formally elected to that office. Capt. Douglas Galton, in replying to a vote of thanks for presiding, said that the Museum had now entered on a fresh phase of existence, and had established itself as an independent institution in premises which, after necessary alterations had been completed, bid fair to serve its purpose, for the present at least, admirably. The Council contemplated making the sanitary arrangements necessary for the Museum itself as perfect as possible, and it was intended that all such arrangements should be useful for teaching purposes; the drainage, for instance, had been carefully considered by Prof. Corfield and Mr. Rogers Field, M. Inst. C.E., and the latter gentleman had generously undertaken to bear the whole expense of carrying it out. Mr. Twining had undertaken the whole trouble and cost of arranging, and for the most part of providing the Food Collection; the Warming, Lighting, and Ventilating have been referred to a Special Committee, whose endeavour it would be to insure that every appliance was the best of its kind. The general collection was to be carefully weeded and re arranged, and it was hoped that the Museum would be opened to the public soon after Christmas.

THE name *isanimones* has been recently applied by M. Brault to curves of equal velocity of wind, and he has made a drawing of such curves for the North Atlantic in summer, using for the purpose 240,000 observations on board ship. It is shown that an approximate numerical value may be attached to each of the ordinary terms used in ship's logs to denote the wind's force. M. Brault's map, which appears in *Comptes Rendus*, is remarkable in that it reproduces almost exactly the map of *mean isobars*. Thus, during summer, that is to say, when the atmosphere is most stable over the great North Atlantic basin, the mean *isanimones* and the mean *isobars* are the same, presenting only differences that are nearly equal to possible errors of observation and of construction. It remains to be seen in what measure this important law is general; M. Brault believes it to be so for every surface of the globe which is under what he calls fundamental maxima and minima (such as the maximum and minimum of Asia, the maximum of the Azores), the fixity and permanence of which are such that they form together, and at six months' interval two distinct systems which suffice to define the two great phases of the annual circulation. (*Ephemeral* maxima and minima are such as appear and disappear daily in our latitudes; while *mobile* or *tempestuous* minima such as cyclones or squalls, are grouped as a third class.)

IN his work on worms, Darwin has described some tower-like dejections which he never saw constructed in England, but which are attributed to an exotic species of *Pericheta*, from Eastern Asia, naturalised in the environs of Nice. M. Trouessart has lately observed similar dejections in gardens near Angers. Having collected a large number of worms from where the towers were made, he found no species of *Pericheta*, nor of any other exotic genus. In two or three cases he surprised the worms at work, and they were *Lumbricus agricola*. It was the anterior part of the body that was lodged in the tower. After the rainy period at the end of September all the tubular interior of each tower (forming a continuation of the subterranean gallery) was quite free; but a few days later it was obstructed by recent dejections. M. Trouessart supposes that the calotte or cap of the tower, getting hard in air, a time comes when the worm can no longer burst the upper wall as before, to place its dejections outside (so increasing the height of the tower), but deposits them within. Thus a long period of rain is necessary for these towers to rise regularly. The towers probably serve to protect the

galleries from rain, and to afford a breathing place for the worms, where they are not seen by birds.

WE learn from the *Rivista Scientifico-Industriale* that Baron V. Cesati has resolved to sell his botanical collection. This consists of a herbarium of about 32,000 phanerogamic species, also a special cryptogamic herbarium containing at least 17,000 species; altogether more than 350,000 plants. There is also a collection of autographs of 2500 botanists. Any one wishing to purchase is desired to apply to the owner, at the Botanical Gardens of Naples. Full particulars of the herbaria will be given.

IN the construction of a railway bridge recently over the Ticino, electric illumination has been used instead of that with stearine candles (previously preferred for the compressed air caissons). The hygienic conditions of the workmen in the caissons is thus greatly improved; as stearine candles impregnate the atmosphere with smoke. Eight lamps of the small Swan type are used to light the working chamber; a Siemens' dynamo of about 30 lamp-power supplying the current. A second dynamo is kept in reserve, to be used in case of breakdown or excessive heating. The additional cost of the system is regarded as largely compensated by the increased comfort in working.

THE additions to the Zoological Society's Gardens during the past week include a Vervet Monkey (*Cercopithecus lalandii* ♂) from South Africa, presented by Mr. G. H. Jones; nine Hairy-footed Jerboas (*Dipus hirtipes*), twenty-four — Gerbills (*Gerbillus* —) from Arabia, presented by Lieutenant Paget, R.N.; a Laughing Kingfisher (*Dacelo gigantea*) from Australia, presented by Mr. H. G. Austin; a Ceylon Jungle Fowl (*Gallus stanleyi* ♂) from Ceylon, presented by Mrs. Dick Lauder; a Spinose Land Emys (*Geomyda spinosa*) from Borneo, presented by Miss C. G. Robson; two Sharp-headed Lizards (*Lacerta oxycephala*) from Madeira, presented by Mr. H. J. Clements; three European Tree Frogs (*Hyla arborea*), European, presented by Miss L. Burness; a Rhesus Monkey (*Macacus erythraeus* ♂) from India, a Malbrouck Monkey (*Cercopithecus cynosurus*) from East Africa, deposited; two Canadian Beavers (*Castor canadensis*) from Canada, an Eyra (*Felis eyra* ♂), two Sun Bitterns (*Eurypyga helias*), a Brown Gannet (*Sula leucogastra*) from South America, two Globose Curassows (*Crax globicera* ♂ ♀) from Central America, a Razor-billed Curassow (*Mitua tomentosa*) from Guiana, a Greater Shearwater (*Puffinus cinereus*) from Lincolnshire, six Knots (*Tringa canutus*), a Lapwing (*Vanellus cristatus*), British, a Matamata Terrapin (*Chelys matamata*) from the Amazons, purchased; a Muscovy Duck (*Cairina moschata*) from South America, received in exchange.

OUR ASTRONOMICAL COLUMN

SCHMIDT'S COMETARY OBJECT.—We have received a circular (No. 48) of the Imperial Academy of Sciences of Vienna, containing a letter from Dr. Julius Schmidt, dated Athens, October 14, in which he notifies his discovery of a nebulous object not far from the head of the great comet, which will be best given in his exact words. He writes:—"Seit October 9, 16^h 51^m, liegt in S.W. neben dem Kometen eine der Form nach stark variable cosmische Nebelmaterie, welche die scheinbare Geschwindigkeit des grossen Kometen zwar etwas übertrifft, doch im Ganzen der Bewegung desselben entspricht." Dr. Schmidt appends the following places, the first and last being from measures, the second deduced from a star-chart.—

1882.	M.T. at Athens.	Apparent R.A.	Apparent Decl.	Dist. from nu- cleus of principal comet.
	h. m.	h. m. s.		
Oct. 9	16 54	10 15 53	—12 53	3 24
10	16 36	10 10 26	—12 43	4 25
11	16 37	10 5 51	—14 33	5 21

On submitting these positions to calculation by the ordinary method of Olbers for a parabolic orbit, Mr. Hind has found the